

1 We claim:

2 ~~1.~~ A method for improving performance of liquid-type fuel cells comprising:
3 providing a liquid-type fuel cell having a fuel and a catalyst, and
4 incorporating into the fuel a fuel additive to reduce CO poisoning to the catalyst.

5 2. The method of claim 1, wherein the fuel additive comprises hemoglobin.

6 3. The method of claim 2, wherein the amount of hemoglobin is in the range of
7 0.0001-1% by weight.

8 ~~4.~~ A method for improving performance of liquid-type fuel cells comprising:
9 providing a liquid-type fuel cell having an electrode and a fuel, and
10 incorporating into the fuel a fuel additive to increase wettability of the electrode.

11 5. The method of claim 4, wherein the fuel additive comprises a surfactant.

12 6. The method of claim 5, wherein the amount of surfactant is in the range of
13 0.0001-1% by weight.

14 ~~7.~~ A method for improving performance of liquid-type fuel cells comprising:
15 providing a liquid-type fuel cell having a fuel, and
16 incorporating into the fuel a fuel additive to reduce dissolved oxygen in the fuel.

17 8. The method of claim 7, wherein the fuel additive comprises an oxygen scavenger.

18 9. The method of claim 7, wherein the amount of oxygen scavenger is in the range of
19 0.0001-1% by weight.

20 ~~10.~~ A method for improving performance of liquid-type fuel cells comprising:
21 providing a liquid-type fuel cell having a fuel, a catalyst, an electrolyte, and
22 incorporating into the fuel a fuel additive to remove metal ions that are
23 detrimental to the catalyst or electrolyte.

24 11. The method of claim 10, wherein the fuel additive comprises a chelating agent.

25 12. The method of claim 11, wherein the amount of chelating agent is in the range of
26 0.0001-1% by weight.

27 ~~13.~~ A method for improving performance of liquid-type fuel cells comprising:
28 providing a liquid-type fuel cell having a fuel and a proton electrotransfer
29 membrane, and

30 incorporating into the fuel a fuel additive in an amount sufficient to improve
31 performance of said liquid-type fuel cell.

32 ~~14.~~ A method for improving performance of liquid-type fuel cells comprising:
33 providing a liquid-type fuel cell having a fuel, a catalyst, an electrode, a proton
34 electrotransfer membrane, and

1 incorporating into the fuel one or more fuel additives that perform one or more of
2 the following functions:

- 3 (a) reducing CO poisoning to the catalyst,
- 4 (b) increasing wettability of the electrode,
- 5 (c) reducing dissolved oxygen in the fuel,
- 6 (d) removing metal ions that are detrimental to the catalyst or the proton
7 electrotransfer membrane.

8 15. The method of claim 14, wherein the one or more fuel additives are pre-packed
9 for field use.

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